Paper No. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte KLAUS GLABE

Appeal No. 1998-2867
Application No. 08/362,747

HEARD: January 9, 2001

Before THOMAS, GROSS, and BARRY, Administrative Patent Judges.

GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 81 through 85, 89, 97, and 101. Claims 86 through 88, 90 through 92, 94 through 96, and 98 through 100 have been objected to as being dependent upon rejected base claims.

Appellant's invention relates to a sensor-fault detection circuit and method. Claim 97 is illustrative of the claimed invention, and it reads as follows:

97. A method for detecting faults in a sensor, comprising

generating a test signal,

simultaneously transmitting said test signal to an input of said sensor and to a first input of a time measuring device,

outputting said test signal from an output of said sensor, after it has been delayed by passing through said sensor, to a second input of said time measuring device, and

determining a time difference between said delayed test signal at said second input and said test signal at said first input, and issuing an error signal if said time difference is not within a predetermined range.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Leiber et al. (Leiber)	4,085,979	Apr. 25, 1978
Bleckmann et al. (Bleckmann)	4,546,437	Oct. 08, 1985
Buchschmid et al. (Buchschmid)	4,652,818	Mar. 24, 1987

Claims 81 through 85, 89, 97, and 101 stand rejected under 35 U.S.C. § 103 as being unpatentable. The examiner applies Leiber alone against claims 81 through 83, 97, and 101, Leiber in view of Bleckmann against claims 84 and 89, and Leiber in view of Buchschmid against claim 85.

Reference is made to the Examiner's Answer (Paper No. 29, mailed August 19, 1997) for the examiner's complete reasoning in support of the rejections, and to appellant's Brief (Paper Nos. 25 and 28, filed April 14, 1997 and July 14, 1997, respectively) and Reply Brief (Paper No. 30, filed September 25, 1997) for appellant's arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellant and the examiner. As a consequence of our review, we will reverse the obviousness rejections of claims 81 through 85, 89, 97, and 101.

Independent claim 81 requires, in pertinent part, a time measuring device which receives, at a first input, a test signal and, at a second input, the same test signal after it has been delayed by passing through the sensor being checked for faults. In other words, the test signal must pass through a sensor along one path to the time measuring device and must go directly to the time measuring device along a second path. Then, the time measuring device measures the time difference between the test signal received at the two inputs.

As pointed out by appellant (Brief, page 8), Leiber does not detect faults in a sensor, but rather detects faults in the control units of an antilocking brake system. Further, the test signal of Leiber never passes through the sensor. Although the examiner asserts that transducer 11 is a sensor and that the test signal passes therethrough, as indicated by appellant (Reply Brief, pages 2-3), transducer 11 is merely an analog-to-digital converter, not a sensor. Even by the examiner's own definition of the term "sensor" (Answer, page 5), transducer 11 cannot be a sensor, since it merely receives a signal from a sensor element 10 but does not sense any physical stimulus.

In addition, despite the examiner's assertions to the contrary (Answer, page 4) appellant correctly indicates (Brief, page 9) that Leiber does not measure the time difference between when the first input receives the test signal and when the second input receives the delayed test signal. Leiber compares the sequences of pulses output by two substantially identical control units and is not concerned at all with the amount of delay <u>through the sensor</u>. In fact, as

explained supra, the test signal never even passes through the sensor and, therefore, cannot be delayed by it.

Thus, Leiber lacks significant limitations of claim 81. The examiner, in the "Response to argument" section of the answer, attempts to provide reasons for modifying Leiber to meet the claims. For example, in response to Leiber's failure to compare a test signal to a sensor-delayed test signal to detect a fault in a sensor, the examiner explains (Answer, page 7) that

> although Leiber runs a test signal through a whole control unit comprising transducer 11, processor 12, logic 13 and logic 16 in order to detect a fault, one of ordinary skill in the art would have found it obvious to run a timing signal through whatever portion of a system that was desired to be monitored for faults. Thus, since Leiber teaches the basic concept of measuring the time it takes a test signal to be processed through a circuit and compare it to a reference time, one of ordinary skill in the art would have found this fault detection technique just as applicable to wheel speed sensors ..., the specific type of sensor not substantially affecting how a fault is detected using test signal timing comparison.

The examiner further states (Answer, page 8),

> Although the generated test signal in Leiber appears to be modified from an original state into a signal sequence in order that testing of processor and logic means can be realized, ... [o]ne of ordinary skill in the art would have recognized that

> a less modified test signal could have been employed in a circuit fault detection device, merely depending on the type of sensor being tested, or the number of potentially faulty elements in a tested sensor circuit.

However, the examiner's conclusions are based on an erroneous assumption that Leiber compares to a reference time the time a test signal takes to pass through a circuit. Leiber instead compares the test signal after it passes through one circuit with the same test signal after it passes through a second substantially identical circuit. Neither is a reference time. Further, the examiner's proposed modifications would involve a complete reconstruction of Leiber's device with no indication from the art as to how one would go about such a reconstruction. Lastly, that the prior art can be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-4 (Fed. Cir. 1992). Thus, the examiner has failed to establish a prima facie case of obviousness. Consequently, we will not affirm the rejection of claim 81 and its dependents, claims 82 through 85, and 89.

Similar to claim 81, claim 97 recites transmitting to a first input of a time measuring device a test signal and to a second input the same test signal after it has been delayed by passing through the sensor being checked for faults. As we have already determined that Leiber fails to disclose checking a sensor for faults, passing a test signal through the sensor, and measuring the claimed time difference, we will reverse the rejection of claim 97.

Claim 101, like claim 97, requires passing a test signal through the sensor being tested for faults and measuring a time difference (although for claim 101, the reference time is the time the test signal is generated rather than the time it is received at the first input). Leiber again falls short for reasons substantially the same as those discussed supra. Therefore, we cannot sustain the rejection of claim 101.

Regarding the rejections of claims 84, 85, and 89, neither Buchschmid (for claims 84 and 89) nor Bleckmann (for claim 85) cures the deficiencies of Leiber noted above. Accordingly, we cannot sustain the rejection of claims 84, 85, and 89.

CONCLUSION

The decision of the examiner rejecting claims 81 through 85, 89, 97, and 101 under 35 U.S.C. § 103 is reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
ANITA PELLMAN GROSS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LANCE LEONARD BARRY Administrative Patent Judge	)	

AG/RWK

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